COMPLEX RADIO CONTROL SYSTEM

JETI model®

duplex

EN User manual

REX Assist receivers

ASSIST

02/2023

duplex

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REX receivers with function ASSIST

1 Introduction English

The REX A receivers enhance the REX series of receivers and extend it with the intelligent flight stabilization feature, which is designed for airplane models and multicopters. This stabilization works in all three axes of the model and facilitates flying in windy or otherwise challenging conditions. Aerobatic maneuvers will be more accurate and smoother. With the help of several flight modes, which are also suitable for beginner pilots, flying practice will be really easy.

The REX A receivers are compatible with all existing 2.4GHz Duplex Tx modules and DC/DS transmitters.

You can set them directly via DC/DS transmitters, alternatively you can use the USBa adapter and JETI Studio software (free download at www.jetimodel.com). The receivers provide internal telemetry (e.g., receiver quality, inertial unit status and G-force level). They also process telemetry from external sensors compatible with Duplex EX or EX Bus

2 Technical data

Basic data	REX 6A	REX 7A	REX 7SA**	REX 9SA**	REX 10A	REX 12A*
Dimensions [mm]	38x25x11	42x28x11	60x16x13	60x16x13	51x28x11	51x28x11
Weight [g]	11	13	13	13	16	24
Antenna lenght [mm]	2x100	2x200	2x200	2x200	2x200	2x400
Number of output channels	6	7	7	9	10	12
Temp. range [°C]	-10 to +85	-10 to +85	-10 to +85	-10 to +85	-10 to +85	-10 to +85
Supply voltage [V]	3,5 – 8,4	3,5 – 8,4	3,5 – 8,4	3,5 – 8,4	3,5 – 8,4	3,5 – 8,4
Average current [mA]	80	80	80	80	80	80
Real time transmission of telemetry data	Yes	Yes	Yes	Yes	Yes	Yes
Programing	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS	Tx - DC/DS
Support satellite receiver (Rsat)	Yes	Yes	Yes	Yes	Yes	Yes
Power output [dBm]	15	15	15	15	15	15
Receiver sens. [dBm]	-106	-106	-106	-106	-106	-106
Frequency [MHz]	2400 - 2483	2400 - 2483	2400 - 2483	2400 - 2483	2400 - 2483	2400 - 2483
Integrated sensors	3-axis gyroscope, 3-axis accelerometer, pressure sensor					
Height measurement sensetivity	0,1m					
Gyroscope measurement range	± 2000°/s					
Accelerometer measurement range	± 16G					
Sampling frequency gyroscope/accelerometer	6600Hz					

*** EPC-External Power Connector- the receiver has power supply cables with an MPX connector**

****S-Slim- slim receiver for mounting in small fuselages**

2.1. Properties

- Up to 16 stabilised airplane channels.
- Support for different multicopter types – from tricopters to octocopters.
- Up to 3 adjustable flight modes, options for stabilising the horizon and altitude.
- In-flight gain tuning using free channels.
- Using the latest 3-axis gyroscope and 3-axis accelerometer.
- Support for LED strip consisting of WS2812 chips.
- Support for external camera gimbal driven by servos.
- Intelligent fail-safe.
- Vibration analysis.
- Full set-up options with DC/DS transmitters or via PC.
- Available telemetry: Receiver voltage, signal quality, G-force, attitude orientation.
- Support of telemetry and up to 3 sensors connected directly.

2.2 Important Notices

- Always use the current firmware in your DC/DS transmitter and receiver. The minimum version of software for transmitters supporting REX A receivers is 4.24.
- Always check the polarity of the lead wires so that the voltages on the receiver and other electronics are not reversed.
- Do not expose the receiver to heat and sudden temperature changes that may affect the accuracy of the sensors.
- Never use a receiver that is visibly damaged. In particular, check the state of the antennas regularly. In no way modify or remove the receiver electronics from the supplied housing.
- When installing on a combustion engine model, keep in mind

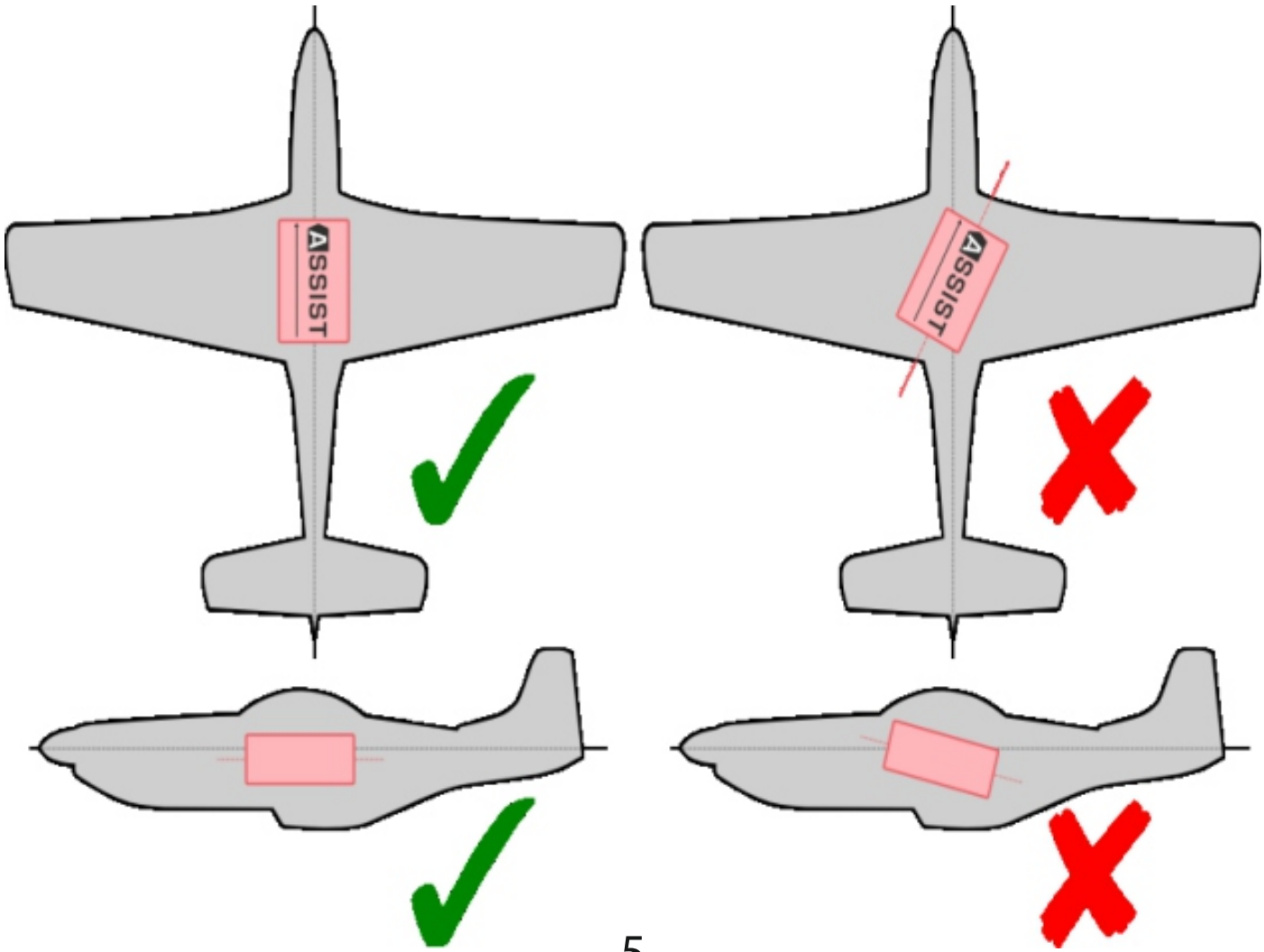
that all electronics must be optically isolated from the ignition unit and ideally located as far as physically possible from the engine itself.

- Do not expose the receiver to excessive vibration. Sensors in the receiver are very sensitive and vibrations are an undesirable phenomenon. It is advisable to check the vibration level with the built-in analyzer before flight and to take appropriate measures to reduce vibration (e.g. attach the receiver in the model with a soft double-sided adhesive tape).
- Do not expose the receiver to direct air flow. Aerodynamic forces may have a strong influence on the sensitive barometric sensor when the model is moving faster.
- Always use a sufficiently sized power source for the receiver and servos. Keep in mind that with the stabilisation switched on, the servos in the airplane model are constantly moving, resulting in increased current consumption and subsequent heating of the components.
- Any major changes to the settings (especially for the initial configuration) should be done without the propellers fitted.
- During use, it is recommended to switch on the transmitter first and then the receiver. The transmitter confirms that the receiver is turned on by an acoustic signal. When turning off the system, first switch off the receiver and then the transmitter.
- REX A receivers do not support Clone mode. This is because the stabilizing receiver should always be the primary receiver in the model. Other „A" type receivers, serving as satellites, must not have the stabilisation enabled.

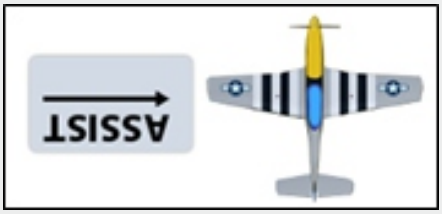
3 Installation

3.1. Installation in the model

Always place the receiver in the model parallel to the flight axes and ideally as close as possible to the center of gravity (especially for multicopters). This is important for the proper functioning of stabilisation and its correct response. It is important that the mounting of the receiver is made in such a way that the vibrations from the model are minimized and that the fixation is guaranteed at the right place. We recommend using a double-sided adhesive tape for this purpose.



There are several ways to place the receiver in the model, and you need to activate this position in the setup wizard. The direction of the arrow on the receiver sticker determines its placement:

 **Rotated - 90°**	 **Standing - right backward**	 **Standing - on the left**
 **Default - Horizontal**	 **Vertical - on the right**	 **Vertical- on the left**
 **Rotated - 270°**	 **Standing - on the right**	 **Standing - left backwards**
 **Rotated - 180°**	 **Upside down**	

3.2. Power supply

When designing a wiring system in the model, always be careful about choosing a suitable power supply so that it is sufficiently current-rated and its output voltage is compatible with the receiver, servos and other electronics. It is recommended that the REX A receivers be powered by low-resistance Li-XXX type batteries or a stabilized BEC voltage source (either as a separate device or integrated in the speed controller).

Note: *never connect two different voltage sources in parallel, even if they seem to have the same parameters.*

The supply voltage can be connected to the receiver in the following ways:

- *Via throttle channel (when using the speed controller BEC).*
- *Using the Battery ports or any free or open receiver port.*
- *Via the MPX connector included on EPC receivers (Extended Power Connector).*

For multirotors, use either a BEC output from a single controller or, in case of Opto-type controllers, use an external stabilised source. Never connect voltages from several BEC circuits in parallel.

3.3. Operation

We recommend that you switch on the transmitter first and then subsequently the receiver. The transmitter confirms the switching on of the receiver with an acoustic signal. When switching off the system we recommend that you switch off the receiver first and then subsequently proceed with switching-off the transmitter.

3.4. Binding

The communication between the receiver and the transmitter is secure and of course digital. Therefore, it's necessary to bind the device (transmitter/receiver). This is always a necessary step when using a new receiver or transmitter. You only need to bind the receiver once, the transmitter will remember the bound devices.

Procedure:

1. ***Insert the BIND PLUG*** *(included in the receiver packing) into the receiver socket labeled Ext.*
2. ***Switch on the receiver*** *– (connect a proper voltage supply to the receiver). Binding of the receiver may now be performed within 60 seconds. After the 60 seconds elapse the receiver returns to setup mode and the binding process must be repeated by starting again from step 1.*
3. ***Switch on the transmitter*** *- the transmitter emits an acoustic signal announcing the detection of a new receiver.*

Note: before turning on the transmitter to bind first make sure it has been set to the correct model file.

Note: *if binding fails, please turn off the transmitter and receiver and repeat the procedure.*

You may bind an arbitrary number of receivers to one transmitter. The receiver, however, can only be bound to one transmitter, i. e. the receiver is only bound to the most recently bound transmitter.

3.5. Range test

By range testing, you verify the correct operation of the transmitter and receiver. You should perform a range test before your first flight of each flight day, or if there are any doubts about the function of the transmitter or receiver. In the range test mode, the transmit power is reduced to 10%. When testing range, place both the model and transmitter at a height of at least 80cm (3ft) from the ground. A properly operating transmitter and receiver should reliably control the model at a distance of at least 50 meters (or 50 yards) in the test mode. If this is not the case, be sure to check the correct installation of the receiver antennas. If the test is not successful afterwards then do not use the device and contact your dealer or one of our service centers.

Setting into Range Test mode:

- Connect the binding plug into the Ext. port of the receiver, turn on the receiver and then the transmitter. Range test mode will be active for as long as the bind plug is inserted in the Ext. port. During the range test, the transmitter warns with an acoustic signal that it is reduced transmission power.
- Alternatively, you can run the range test in the DC/DS transmitter via the System – Servo & Range Test menu.

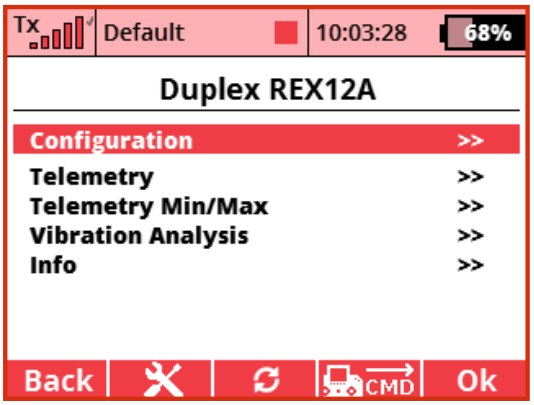
4 Quick setup

4.1. Airplane

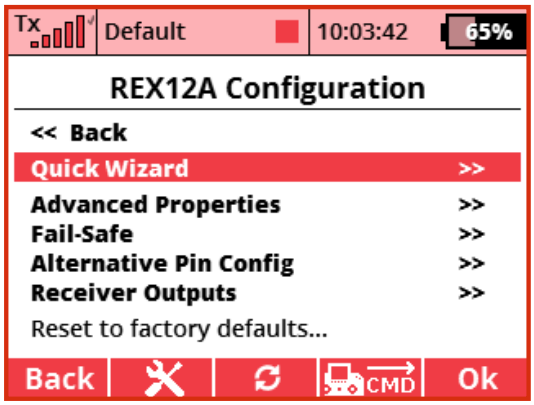
From production the REX Assist receivers behave as standard receivers and stabilisation is not active by default. This can be used to set up an airplane model - the initial procedure is similar:

1. Place the receiver in the model according to the "**Installation in the model**" chapter.
2. Create a new model in the transmitter as usual. The individual channels of the transmitter should correspond with the outputs on the receiver.
3. Bind the transmitter with the receiver.
4. For the model, set its subtrims, dual rates and expos according to the recommended values. Do not set up advanced mixes or change the servo path using servo balancer.
5. Now go to the receiver configuration – either through the DC/DS menu a) *(Model -> Device Explorer)* or via your PC *(see chapter Configuring the Receiver with PC)*.
6. Run the stabilisation setup wizard b) *(Configuration -> Quick Wizard)* . On the first screen, enter the *"Airplane Assist"* option and go to the next page with the *"Next"* link.

a)

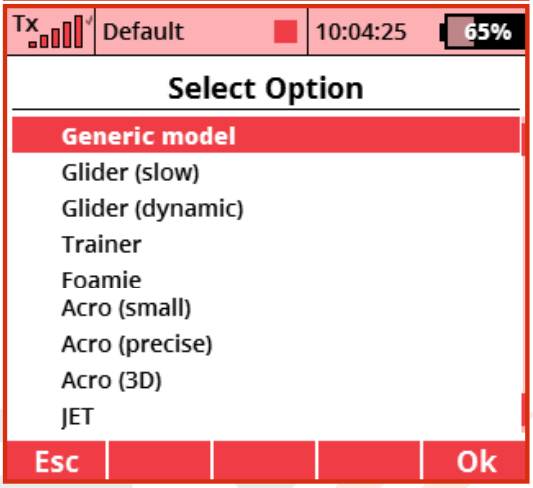


b)



7. Specify the model type so that its flight characteristics best match one of the options. Each model type includes preconfigured and optimised stabilisation presets.

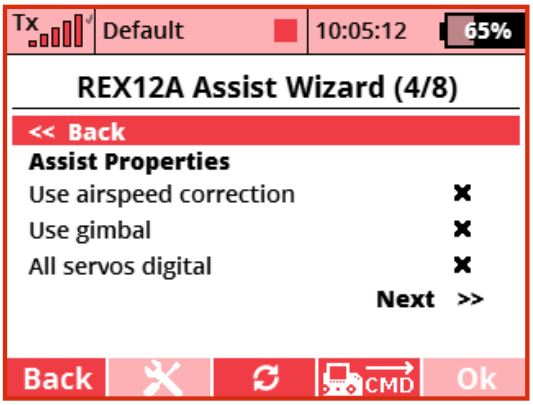
8. Select the receiver position in the model so that the displayed graphics matches real situation. A total of 11 options are available *(see chapter Installation the model)*.



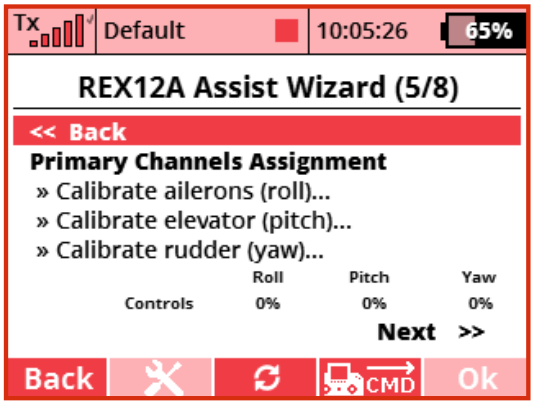
9. Now check for additional features:

- **Use camera gimbal** - by selecting, you enable the function of an external servo control for camera gimbal.

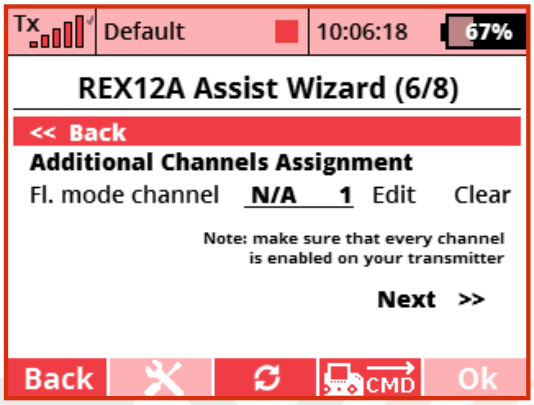
- **All servos digital** - This option specifies the servo output period. If all the servos are digital in the model, the output period will be automatically set to 7.5ms. Otherwise, it will be 17.5ms.



10. Carefully make the calibration of the sticks, elevators and rudder functions step by step according to the instructions of the wizard. After correct calibration, the values in the Controller line have to be in the range of -100/0/+100 in the neutral and full positions of the controller of the exact function.

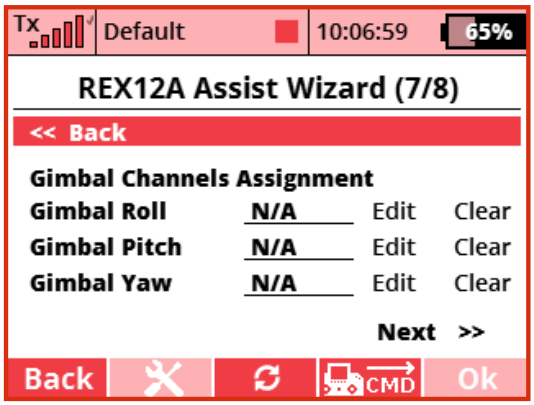


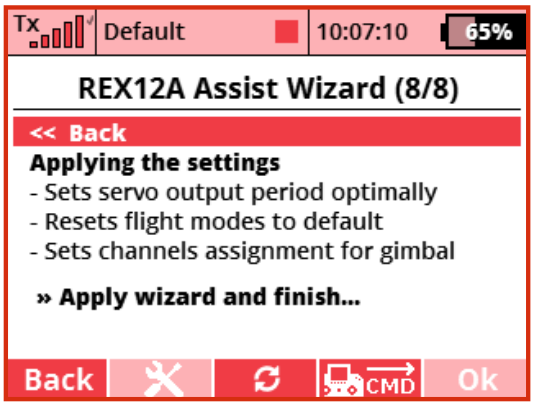
11. Assign a channel for switching stabilisation flight modes. For the possibility of choosing three flight modes of stabilisation, select one of the three-position switches.



Note: *first add a three-position switch to your DC/DS transmitter as a new function in the Model – Functions Assignment menu. Then assign this option to a free channel in the Model – Servo Assignment menu. Subsequently, this three-position switch can be used here in the receiver setup wizard.*

12. If you have selected the "*Use gimbal*" option in the previous steps, assign the individual channels to the gimbal control. You can skip this point and configure the camera gimbal later in the ***„Configuration -> Channel Assignment -> Gimbal channels"***.





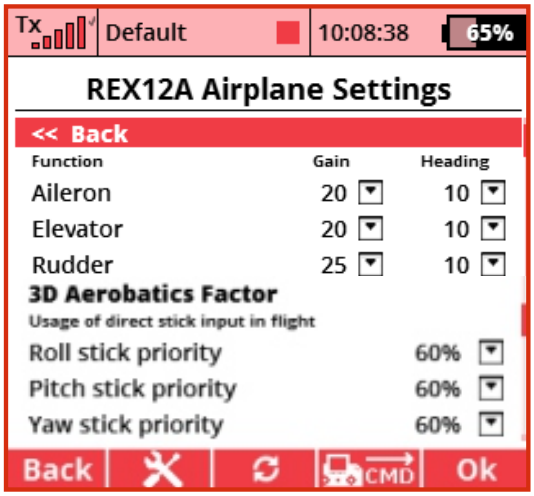
13. Confirming the ***"Apply and exit wizard"*** option will save the set stabilisation parameters and exit the setup wizard.
14. Before flight, place the model on the ground and hold it stable during the gyroscope initialization. Once the initialization is completed, it is then possible to control servos.
15. Check for correct input control response and stabilization function when moving in each axis. For example, if you rotate the model to the left, the control surfaces should tend to move in the opposite direction.
16. Make the first flight either with stabilisation disabled (manual mode) or in ***"Normal"*** mode. If the model does not fly straight, trim it and then land. Re-assign the primary channels (see point 10).

Note: *system calibration has to be made after each model trim.*

4.1.1. Airplane model settings optimization

In the ***"Airplane Settings"*** menu in the REX A configuration you can fine-tune the stabilisation gains for individual axes:

Gain – adjustment of the gain (sensitivity) of stabilisation for each axis separately. If the model is not sufficiently stabilised, increase the gain until the model starts to oscillate slightly in flight. Then reduce the gain to a stable flight. Try the new settings at different model speeds and verify that there are no oscillations even at high speeds.

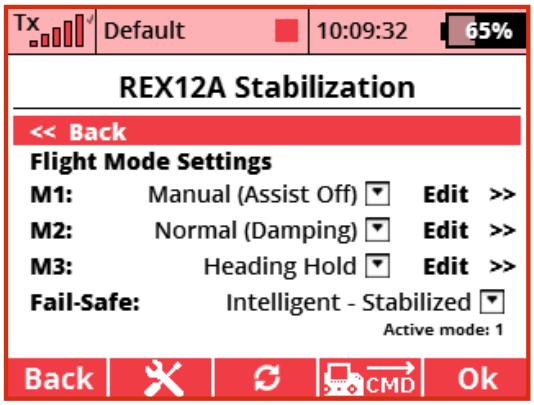


Heading hold – determines how strongly the model will hold its orientation in the given direction in the ***"Heading Hold"*** mode. In the ***"Normal"*** mode, this parameter is not reflected in any way. You can only test the direction holding function, for example, while hanging on a propeller, or in knife edge flight.

3D Aerobatic Factor (Stick Priority) - determines how the stabilisation gain decreases depending on how the control stick moves from the center position. For instance, a 60% aileron stick priority means that at maximum left or right, the aileron gain will be reduced to 40% and the stick direct position will be applied from 60%.

4.1.2. Choice of flight modes

Depending on your preferences, choose which flight modes to use during flight - a total of 5 modes are available, allowing you to switch between three in flight *(see Description of flight modes section)*.



For each Flight mode, you can set the default gain (this multiplies the stabilisation gain and the heading hold ability in all axes). You can also specify whether to use the gain tuning via special dedicated channels *(see **„Configuration - Channel Assignment - Assign Additional Channels”).***

Turn assistant - stabilisation will automatically optimize the turning of the model using ailerons and rudder.

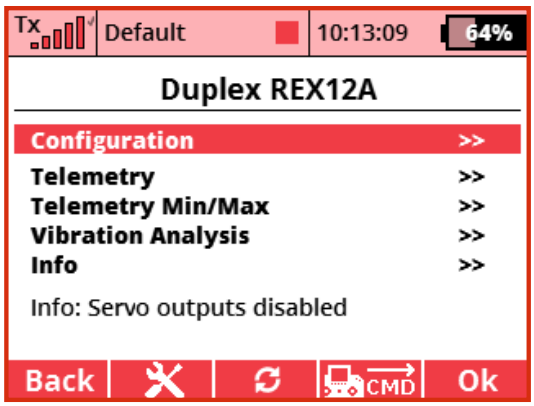
Damping only - Ticking this option will allow you to use butterfly, trims and glider mixes without any side effects.

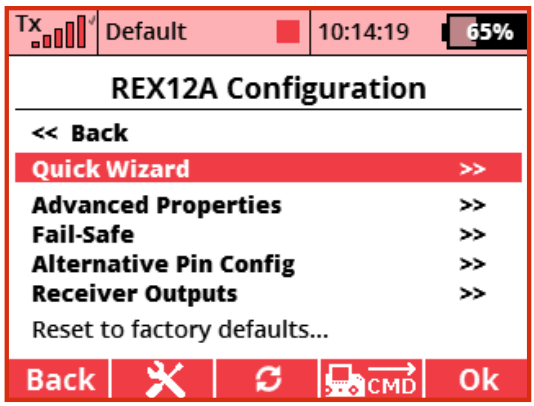
Fail-Safe: in **"intelligent"** mode, the system will actively stabilise the model in horizontal flight when the signal is lost. When **"*Assist off*"** is selected, the Fail-Safe system will only work according to the settings in the **"*Configuration/Fail-Safe*"** menu of the receiver.

4.2. Multicopter

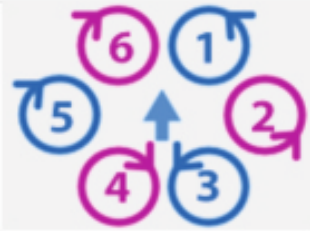
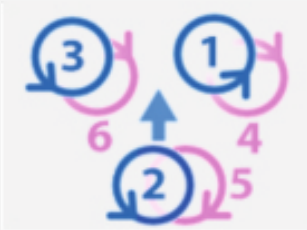
Before you connect and configure the REX A receiver for the first time in a multicopter model, we recommend disconnecting speed controllers with motors from the receiver to avoid accidental spinning.

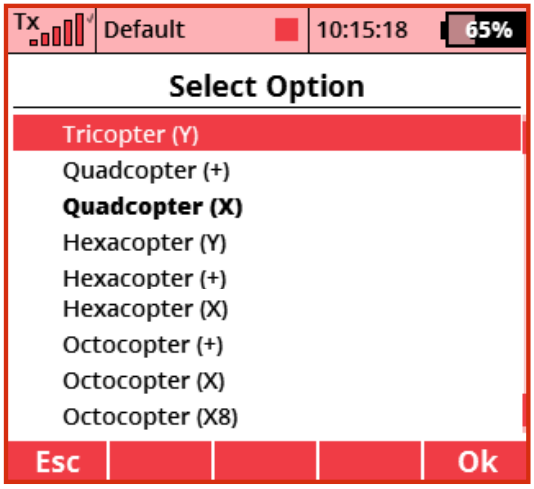
1. Remove the propellers from motors.
2. Place the receiver in the model according to the *„Installation in the model"* chapter.
3. In the transmitter, create a new multicopter model. When setting up, make sure that ***Motor/Throttle, Aileron/Roll, Elevator/Pitch, Rudder/Yaw*** **and** ***Flight-Mode*** switching functions are operated separately on each channel.
4. Bind the transmitter with the receiver.
5. Navigate to the receiver settings either via the DC/DS menu *(Model -> Device Explorer)* or via USB adapter and JETI Studio.
6. Run the stabilisation setup wizard *(**"Configuration -> Quick Wizard"**)*. On the first screen, enter the **"*Multicopter Assist*"** option.



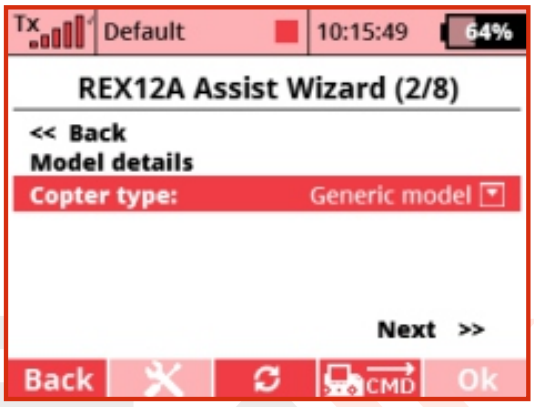


7. Select the type of your multicopter frame and continue to the next page by pressing the *"Next"* link. The following types of frames are supported (direction of rotation and motor sequence have to always be observed):

 **Tricopter Y**	 **Quadcopter +**
 **Quadcopter X**	 **Hexacopter +**
 **Hexacopter X**	 **Hexacopter Y**
 **Octocopter + (REX10 A a REX12 A)**	 **Octocopter X (REX10 A a REX12 A)**



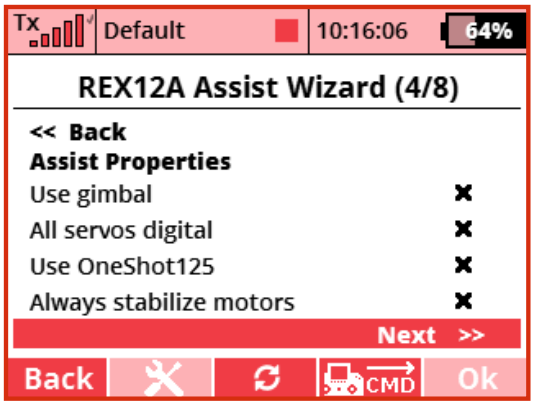
8. Select the multicopter characteristics to best match your model. Each type includes preconfigured and optimised presets for stabilisation so that the first flights are enjoyable and additional settings are kept to a minimum.



9. Select the receiver position in the model so that the displayed graphics matches real situation. A total of 8 options are available (see chapter *Installation in the model*). The illustration indicates flight direction.

10. Check for additional features:

- **Use camera gimbal** - by checking this option, you enable the function of the external servo-controlled camera gimbal.
- **All servos digital** - this option specifies the output period for servos that are used as additional

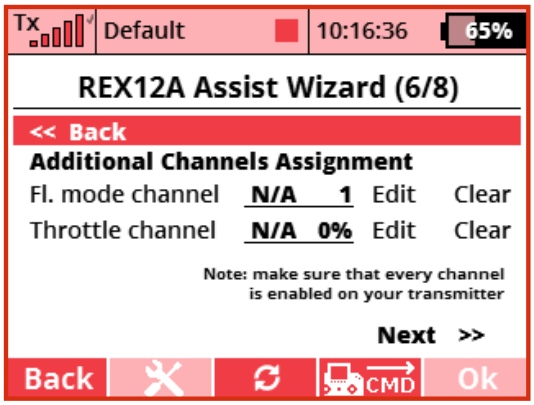


channels. If all the servos in the model are digital, the output period will be automatically set to 7.5ms. Otherwise, it will be 17.5ms. The output control period for the motors is 2.5 ms, which means 400Hz.

- **Use OneShot125** - by checking this option, you enable the OneShot125 mode to control the multicopter speed controllers. This is a special mode where the pulses from the receiver are eight times shorter than the standard servo pulses. OneShot125 must also be supported on the controllers side.
- **Always stabilise motors** - after activating this option, the multicopter will be stabilised from the moment of arming and the first throttle application until switching off the motors. Stabilisation will always work, even with throttle at idle position. This option is not recommended for first flights with a multicopter.

11. Assign the individual channels for stabilisation so that the receiver learns neutral positions and channel throws. Follow the step by step guide. Calibrate all axes sequentially one by one. Check correct responses to the controls by the values displayed in the *"Controls"* list.

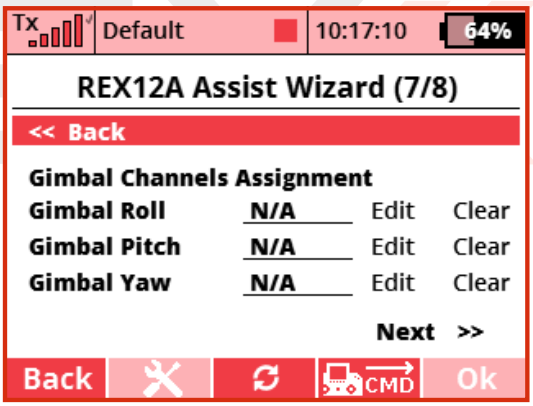
12. Assign a channel for switching flight stabilisation modes. This channel should be operated by a three- position switch, so that all three flight modes should be



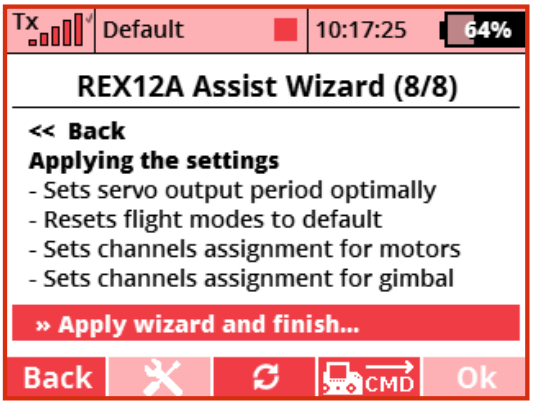
available. In *position 1* the altitude and horizon stabilisation is enabled by default. Switching to *position 2* (center), a simple horizon stabilization mode with direct throttle is activated. Switching to *position 3* activates the aerobatics mode. Assign the throttle channel. Make sure this channel on the indicator works in the range 0-100% (1-2ms).

***Note:** add the three-position switch as a new function (flight mode) in the transmitter menu **„Model/Functions Assignment".** Then add this switch to the free channel in the menu „Model/Servo Assignment". After this you will be able to assign this three-position switch according to reference 12. as a switch for stabilisation flight modes.*

13. If you have selected ***"Use gimbal"*** in the previous steps, assign the individual channels to control it. You can skip this point and configure the camera gimbal later in the menu ***„Configuration/Channel Assignment/Assign gimbal channels".***

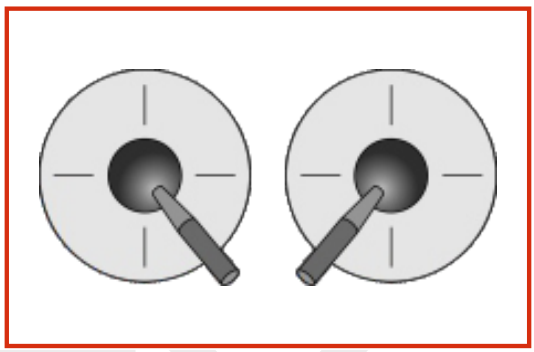


14. Finish the wizard and application settings. After executing the *"**Apply wizard and finish**"* command, the parameters in the receiver are stored and the stabilisation is reset to the mode according to the data you've entered.



15. In the ***„Configuration/Multicopter Settings"*** menu, test the correct rotation direction of the motors according to the diagram displayed on the top of the screen.

16. Now lay the model on a flat surface - once the stabilisation is initialized, the speed controllers usually respond by beeping. Try arming the motors (still without the propellers attached):



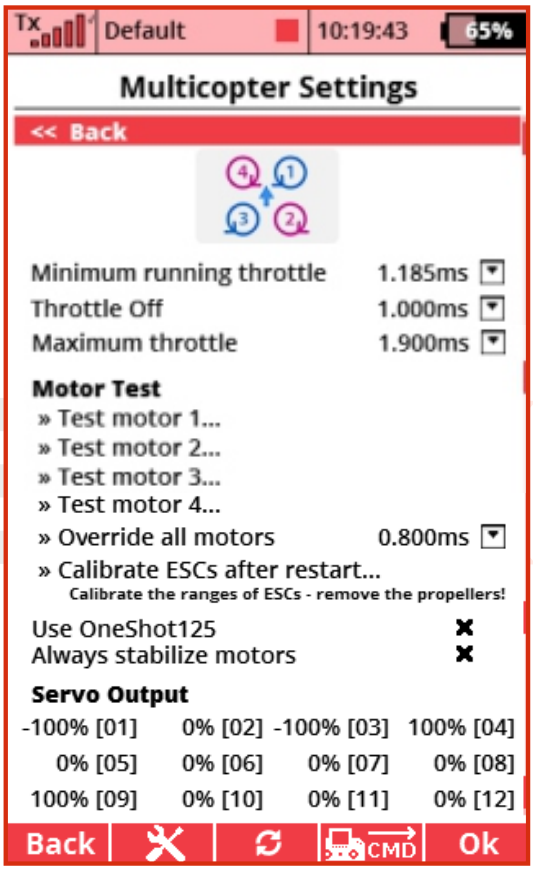
With the throttle at idle position, move the two sticks to the extreme positions (the elevator fully up and the ailerons with the rudder towards each another): Motors should start spinning and after 3 seconds without applying throttle they should stop. If the motors are not spinning, check the ***"Minimum running throttle"*** parameter in the ***„Configuration / Multicopter Settings"*** menu.

17. Before your first flight, it is necessary to test the stabilisation reaction with the propellers, ideally when the model is mounted on a test bench which allows rotation in only one axis. It is necessary to ensure that the model in the *Aerobatic* or *Sport* mode is able to maintain a constant direction at zero stick movement and also to avoid undesirable oscillations.

18. Make your first flight in calm air on a grassy or other soft surface with plenty of space. Start by arming the motors and lightly adding throttle. Use small stick movements to make sure that the receiver responds in correct direction of each axis and tries to stabilise the model. If you experience any unexpected behavior, be prepared to immediately lower the throttle and land.

Continue flying in one place and at low altitude - if the flight is unstable or oscillation occurs in any axis, land and adjust the gain of the PID control loop (*see the next chapter)*. Retest the new setting again in flight.

4.2.1. Optimize multicopter settings



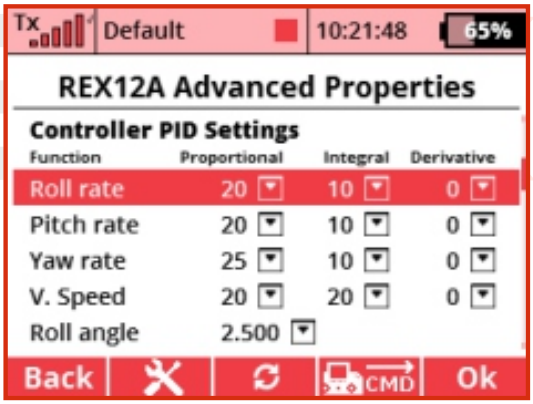
Before your first flight with a multicopter model, always test the rotation direction of the individual motors. In the receiver configuration, go to the Multicopter Settings menu. Here, choose a minimum value for running throttle to make the motors slowly spin when the multicpoter is armed. Set parameters ***„Throttle Off"*** and ***„Maximum throttle"*** according to the recommended setting from the manufacturer of your ESC. Test the rotation direction of each motor by activating the command *„Test motor"*. The corresponding speed controller receives a command to run at minimum revolutions for approximately 1s. The rotation direction must correspond to the diagram in the menu on the transmitter display. If the motor rotates in the opposite direction, swap any two motor leads between each other.

Overwrite all motors - you can enter any value from 0.8 to 2.2ms, which is sent to all motors at the same time after the **F4** ***"Apply"***

buttonon the transmitter is pressed.

Use OneShot125 - check this option to enable OneShot125 mode for controlling the multicopter speed controllers. This is a special mode where the pulses from the receiver are 8 times shorter than standard servo pulses. OneShot125 must also be supported by the speed controllers in your model.

Always stabilise motors - after activating this option, the multicopter will be stabilised from the moment of arming and applying the throttle for the first time until the model is disarmed, which means the motors are switched off. Stabilisation will always work even with the throttle at idle position. This option is not recommended for first flights with your multicopter.



PID fine-tune - If the multicopter behavior is not entirely ideal, you can fine-tune the PID gains of the stabilisation loop for each axis separately.

Proportional coefficient – this is a basic parameter of stabilisation. The response of the control unit is directly proportional to the desired rotation speed. If the multicopter is not sufficiently stabilised in some axis, e.g. the pilot must always interfere with the steering to keep the model in the air, increase this factor (at each step, for example, by 20%). Once the oscillation starts, reduce the proportional factor by 20%.

Integral coefficient - determines the weight of stabilisation error accumulated from the past. Thanks to integrating, the receiver is able to return the model to its original orientation, even if it has been previously displaced. Set this factor so that the model does not tilt in the air in any axis and keeps a steady attitude in the Sport or Acrobatic mode. If the coefficient is too high, slow but strong oscillations might appear.

Derivative coefficient - the derivative component of the stabilisation loop responds to rapid changes in model orientation and is able to suppress, for example, the effects of wind gusts. Edit the value of the derivative component very carefully with small steps, as the model might begin to oscillate very quickly.

When testing the modified coefficients, take off and apply small but fast movements on the inputs and check if the multicopter reacts quickly, but without overshoots. The rudder axis (Yaw) is not so critical for fine tuning the gain - after moving a stick in yaw direction, the multicopter should not become unstable and should not experience significant changes in altitude. Leave the derivative coefficient at zero.

For multicopter models, the altitude and climb/descent stabisation can also be tuned. If the model responds more violently than expected to the climb command, lower the proportional coefficient in the appropriate row (Vertical Speed). Conversely, if it does not respond to the altitude change at all, increase the coefficient value.

4.2.2. Choice of flight modes

Depending on your preferences, choose which flight modes to use during flight - a total of 5 are available, switching between three is available (*see the Description of flight modes section).*

For each flight mode, you can set the default gain (this multiplies the proportional, integral and derivative coefficients in all axes), and you can specify whether you want to use gain tuning via special channels *(see* ***„Configuration -> Channel Assignment -> Additional Channels Assignment****").*

Determine the fail-safe mode:

In intelligent mode, the receiver will stabilise the model horizon (at the last known throttle level). On the other hand, when selecting *"Assist Off"*, all engines will be stopped.

4.3. Description of flight modes

In the REX Assist receiver, you can switch between several flight modes, with the 3 default ones being preset.

4.3.1. Manual (Assist Off): Airplanes

The basic airplane mode where the stabilisation function is completely deactivated and the pilot takes over the manual control.

4.3.2. Training: Airplanes

This mode is used by the pilot to get accustomed to the model's behavior, and is also useful for beginners. Basically the stabilisation

does not interfere with the steering when the model flies horizontally. However, as soon as you want to make a manoeuvre, the stabilisation will not allow you to exceed the maximum safe angles for tilting the aileron axis or the elevator. Aerobatics in this mode is not possible.

4.3.3. Normal (Damping): Airplanes

This is a basic mode for flying in the wind, suitable for takeoffs and landings. Stabilisation works in 3 axes and suppresses the effects of external forces like wind turbulences or gusts. Aerobatics may be unlimited. In this mode, you can use trims even for stabilised axes.

4.3.4. Heading Hold: Airplanes

A mode designed for those aerobatic figures where it is necessary to maintain the constant flight direction. These include, for example, hovering or knife edge flight. Do not use the Heading Hold mode at takeoffs or landings, as there may be a risk of stalling at low speeds and the stabilisation would increase the effect even more, which could lead to a crash. Do not use trims in this mode, because any shift of the center position will be perceived as an instruction to start rotation.

For gliders, do not use Heading Hold mode if the model is moving at or near stall speeds (typically when flying in thermals). The model stops being sensitive to climbing currents, and then dropping and falling may occur because the stabilisation correction is not able to fully return the model to its original orientation with the only function of control surfaces.

4.3.5. Stabilisation of the horizon: Airplanes and Multicopters

Stabilisation of the horizon is also suitable for beginners. In this case, the stabilisation algorithm makes it possible to perform basic aerobatics, but if the pilot leaves the controls in the center position, the model is levelled to horizontal flight. For airplane models, keep in mind that it is necessary to maintain sufficient speed, as the Heading Hold mode is active at the same time.

4.3.6. Stabilise: Multicopters

The basic functions of the REX A receiver to stabilise the multicopter. The model is kept in a horizontal position during the flight, with the position of the controls indicating the pitch and roll angle of the multicopter. Maximum tilt angles can be defined in the Configuration - Advanced Properties menu, by default it is set to ±45°. In this mode, altitude stabilisation is not active, and there is no possibility of aerobatics.

4.3.7. Sport: Multicopters

This mode allows basic aerobatics even for multicopters, since the receiver only stabilises the rotation speeds in individual axes and does not level the model to the horizontal flight. Altitude stabilisation is also deactivated. The transmitter sticks control the rotation speed of each axis, the maximum speed can be defined in the Configuration - Advanced Properties menu (Max. roll/-pitch/yaw rate).

4.3.8. Acro: Multicopters

This mode is similar to the Sport mode, additionally with direct stick input applied (adjustable in *„Configuration - Advanced Properties - Aerobatics Factor/Stick Priority"*). E.g. The 60% aileron stick priority means that at maximum left or right stick position, the aileron stabilisation gain will be reduced to 60%, and from 40% the direct stick position will be applied.

4.3.9. Altitude stabilisation: Multicopters

This mode is similar to the Stabilise mode, with the climb and descent rate being stabilised. The throttle position indicates vertical velocity. In the neutral position of the stick (which is around 1.5ms), constant altitude is stabilised. By adding the throttle, the model starts to climb.

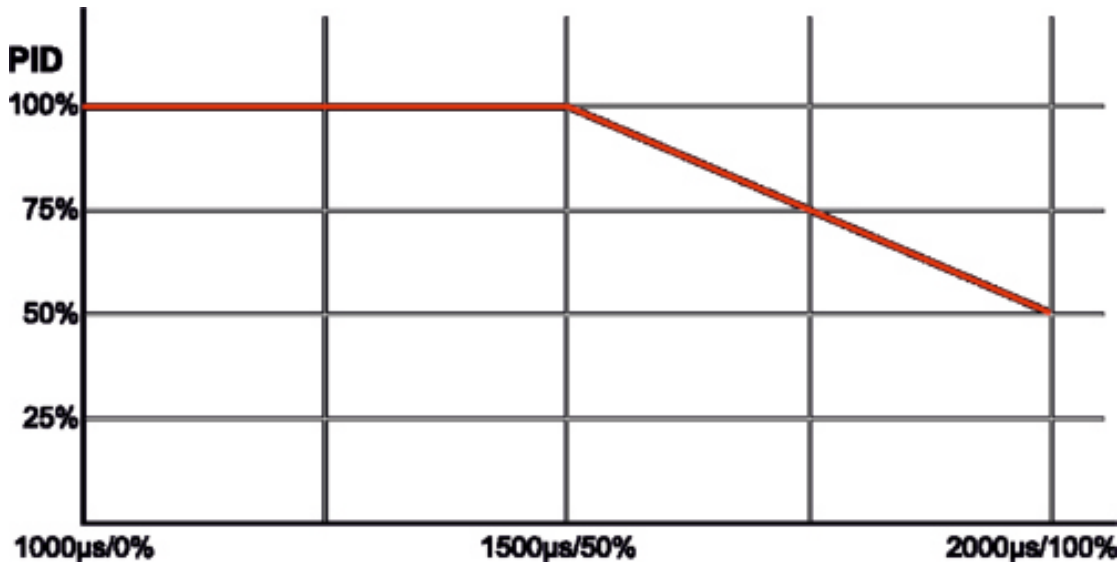
Caution: *if you completely pull the throttle to idle position to reach the maximum descent speed, keep in mind that if you do not use „Always stabilise motors" option, the stabilisation will be completely deactivated and the model may crash. We recommend not fully pulling the throttle when descending, or shifting the throttle curve on your transmitter.*

Default configuration of flight modes for aircraft		
Position 1	**Position 2**	**Position 3**
Manual (Assist Off)	Normal (Damping)	Heading Hold
Default configuration of flight modes for multicopters		
Altitude stabilisation	Stabilise	Sport

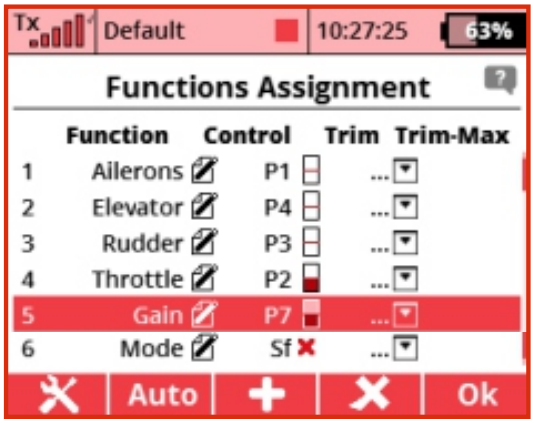
5 Additional stabilisation features

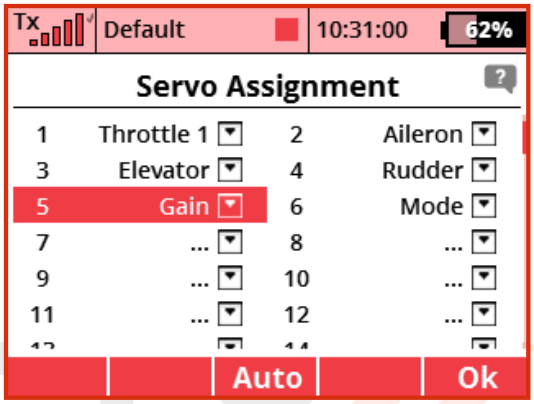
5.1. Throttle to PID attenuation (TPA)

This feature is available for multicopter models to help suppress oscillations when throttle is pushed rapidly. If the model flies well with low throttle, but begins fast oscillations when adding throttle, set *"TPA breakpoint"* and *"TPA value"* in the menu *„Configuration/Advanced Properties"*. Set the breakpoint below the level at which the oscillations begin and gradually increase the TPA value in increments of 10%, until the flight is comfortable even with full throttle. Example of TPA setting in a graph: *"TPA breakpoint"* = 50%, *"TPA value (PID reduction)"* = 50%. If you set more than 50% throttle, the stabilisation gain will begin to decrease to a final 50% at full throttle.



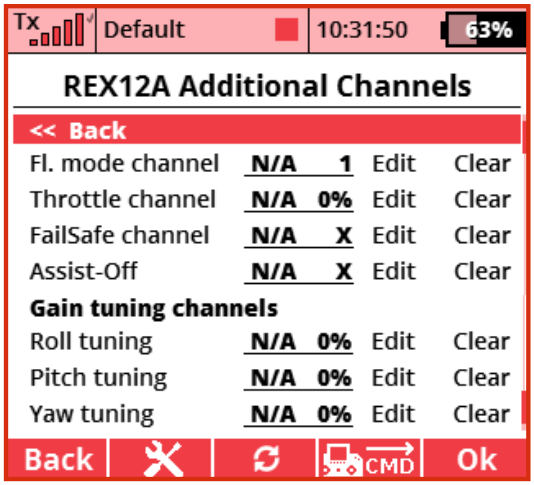
5.2. Additional channels





To assign additional channels, locate ***„Configuration/Channel Assignment/Assign Additional Channels".*** For proper operation, each channel must first be created on the transmitter – when using DC/DS transmitter via the ***„Model menu/Function Assignment"*** **and** ***„Servo Assignment".***

1. In the transmitter menu ***"Menu/Model/Function assignment"*** create the necessary functions and assign controls to them. In the picture, these are the functions *"Gain"* for setting the sensitivity of stabilisation and *"Mode"* for switching flight modes of stabilisation.
2. In the transmitter menu ***"Menu/Model/Servo assignment"*** assign the created functions to the receiver outputs. Use unnecessary and unused outputs.



Flight mode switching channel - here you can assign a dedicated channel to switch flight modes. This channel should ideally be operated by a three-way switch on the transmitter.

Throttle channel - is important for multicopter models. A proportional throttle control channel will be shown here.

Fail-Safe channel - Here you can assign a dedicated channel operated by a two-position switch that, after switching to the active position, will simulate the signal loss event. The servos will move to their predefined positions afterwards. Engine control remains active.

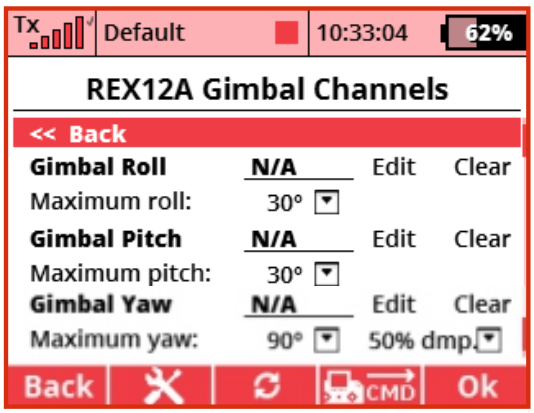
Assist-Off channel - Here you can assign a dedicated channel operated by a two-position switch, which, when switched to the active position, forces the stabilisation to switch off (i.e. the airplane model will enter the manual control mode while the multicopter stops the motors immediately).

Note: *multicopters may stop motors immediately after activation.*

Gain tuning channels - Ailerons/Roll, Elevator/Pitch and Rudder/Yaw - assign proportional channels controlling stabilisation gains in each axis if needed. Positive value increase up to double the default gain, while negative percent values decrease to a minimum of 10%. The value of 0% corresponds to the unchanged default gain value.

5.3. Camera gimbal

REX A receivers support the connection of up to three-axis camera gimbal, whose individual axis (roll, tilt and pan) are controlled by servos connected to individual channels. If you plan to use this feature, activate it in the Assist Setup Wizard, click *"Use gimbal"*. You



can configure the individual outputs for the gimbal servos either by going through the wizard (step 7) or in the ***„Configuration/Channel assignment menu /Gimbal channels"***.

Gimbal Roll - shows the channel assigned in the transmitter to tilt the camera to the left and right. The same channel will be used on the receiver side for the output of the given camera gimbal axis.

Maximum roll - specifies the angle at which the tilt servo is at its maximum displacement. Set this value so that the image stays stable when moving the model and does not tilt left or right.

Gimbal Pitch - shows the channel assigned in the transmitter to tilt the camera up and down. The same channel will be used on the receiver side to output the given camera gimbal axis.

Maximum pitch - specifies the angle at which the servo is tilted to its maximum deflection. Set this value so that the image is stable when moving the model and does not tilt up or down.

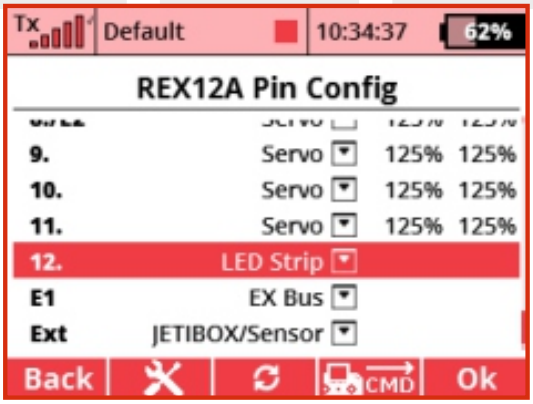
Camera Yaw (pan) - shows the assigned channel on the transmitter to rotate the camera. The same channel will be used on the receiver side to output the given camera gimbal axis.

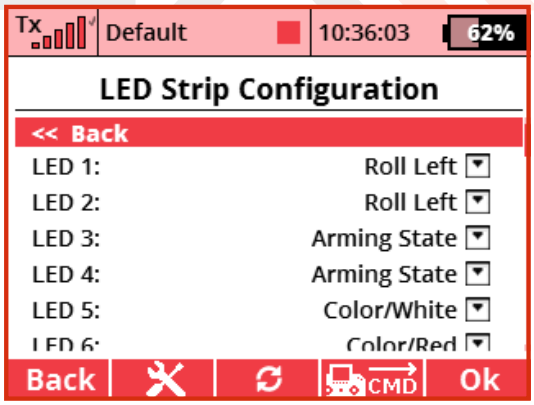
Damping (dmp.) - damping factor in the rotation axis. The higher the value, the longer the camera will stay in the original direction, and it will take longer time for it to turn to the new direction. At 100% the gimbal will always try to keep the original orientation.

5.4. Connecting an external LED strip

The REX A receivers support the connection of an external LED strip consisting of up to 32 programmable RGB LEDs of the WS2812 type. A single receiver port is dedicated to the strip, which must first be configured to enable the strip. In the *„Configuration/Alternative Pin Configuration"* menu, select the dedicated output pin and switch it to *"LED Strip"* configuration. The *"LED Strip Settings"* link then appears in the receiver configuration, allowing you to change the colors and functions of the individual LED chips.

The connection of LED strip itself is simple, you can connect the three-core cable terminated with the JR connector on the input side of the strip (with the pad marked Din). This connector is then plugged into a dedicated port in the receiver.





The function and color of the LED light is adjustablesequentially according to their order and each of the diodes can be setindividually according to the table:

Off	LED not lit
Arming	The color indicates the "Unlocked" and "Locked" states, i.e. disabled or enabled stabilisation functions of Assist
Flight mode	A different LED color indicates which of the three flight modes is active.
Tilt to left	Blinking orange indicates the tilt of the model to the left.
Tilt to right	Blinking orange indicates the tilt of the model to the right.
Color	Choosing the color that the LED should light up. Options are: white, red, orange, yellow, light green, green, dark green, cyan, light blue, blue, dark purple, magenta, hot pink.

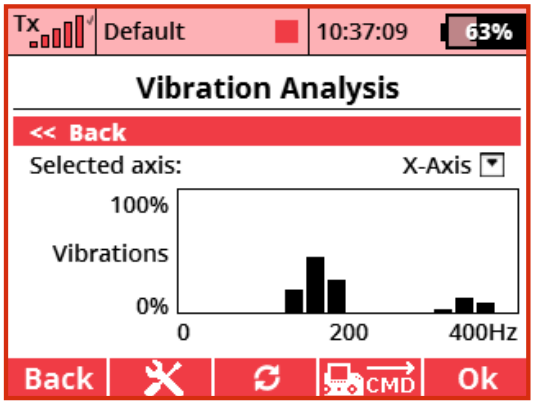
5.5. Vibration analysis and filtering

REX Assist receivers have a graphical vibration analyzer and advanced digital vibration filtering algorithms. In this way, it is possible to suppress unwanted effects caused by vibrations in the model. The analyzer graphically displays the intensity of vibrations at different frequencies, and with the help of two filters you can subsequently eliminate their negative effects on the functions of the stabilisation system. Filter settings are in the receiver menu ***"Configuration/ Advanced settings" section "Gyroscope filtering".***

5.5.1 Vibration analysis

Vibrations are an unwanted phenomenon in any stabilisation system, as they affect the measurement with "noise". In the receiver menu, you can view a graph of the current vibration level. If the vibrations are high (about half the range of the Y-axis in the graph), we recommend taking some steps to reduce them:

- stick the receiver with soft double-sided adhesive tape (included in the package)
- fix the cables leading to the receiver so that they cannot move freely in the model or transmit vibrations
- use a balanced propeller.



5.5.2 PID Derivative Low-Passfilter

- here you enter the frequency of the digital filter (in Herz units) to suppress noise of the derivative component of the stabilization control loop. Recommended value of 20Hz should be modified with caution.

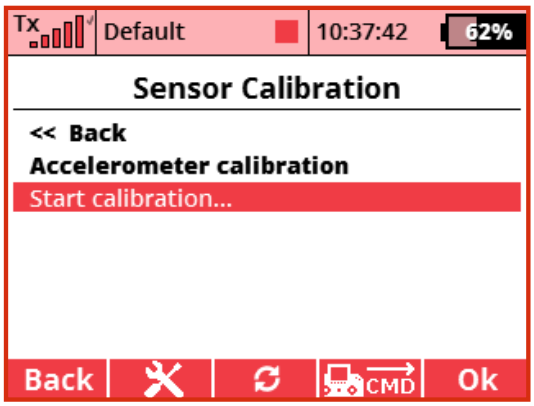
5.5.3 Band Filter (Notch Filter)

– it's used to filter out specific frequencies caused by engine vibrations. You can additionally activate this filter if the vibrations caused by the engine are relatively high. Check the vibration level regularly via *"Vibration Analysis"* receiver menu with the engine running. The engine should run at such revolutions as are most common in flight.

5.5.4 Example of band filter adjustment

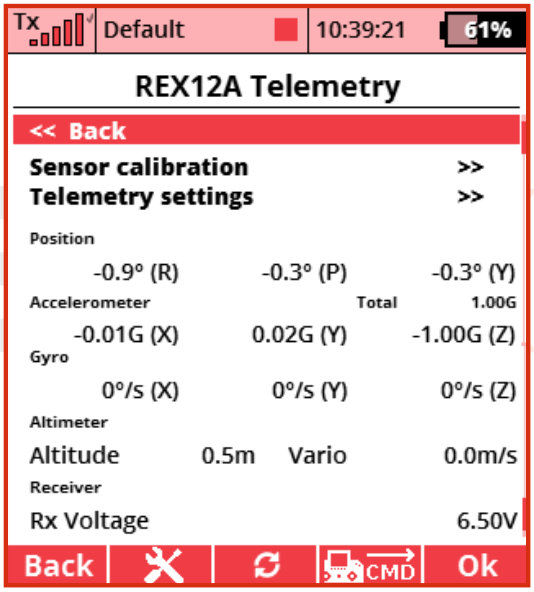
- the illustration shows vibrations of a motor that rotates at 200Hz, 12000 rpm. We will choose the average filter frequency of 200Hz, as there is a peak in this area. We set the filter bandwidth somewhere between 50-150Hz. The narrower the filter bandwidth, the more precisely the filter will be able to reduce the signals with the specified frequency. However, as the motor speed and thus the vibration frequency changes during flight, it is preferable to choose wider bandwidth, approx about 100Hz.

5.6. Sensor calibration



Sensor calibration is important for the correct and accurate function of stabilisation. The receiver calibrates the offsets of an internal **gyroscope** automatically, always after the receiver is switched on. Approximately for 2 seconds after turning on, keep the model at stationary position. It's not required to keep the model horizontally, but the tilt angle should not exceed 30°. Once the gyroscope is calibrated, the

stabilisation is armed and ready for flight.
The internal **barometer** is being calibrated at the same time as the gyroscope to create a reference zero level for calculating the relative altitude.
Calibration of the accelerometer is a more complex process. The receiver is already calibrated from the factory, but due to the Earth's gravitational field, which is not constant all over the planet, the accelerometer can show inaccurate measurements. We recommend you to calibrate the accelerometer also when you configure the receiver in a new model for the first time:



1. In the receiver menu, view *„Telemetry/Sensor Calibration"* screen. Activate the *"Start calibration"* command and follow the instructions.
2. The receiver must be placed on a horizontal board on one of its six sides and kept still for about 2 seconds. Once the position is correctly recorded, the *"Remaining positions"* line reduces one point at a time, rotate the receiver through all six surfaces.
3. After calibrating the last position, the receiver will report successful completion.
4. After completing the calibration, please make sure that the total GForce displayed on the Telemetry screen lies in the range of 0.99 - 1.01G (measured at rest).

6 Advanced properties

Output period – setting the signal period for the servos. At lower values, the servos have a faster response and more consumption. For analog servos, the recommended period is 20ms, for digital servos *"Auto"*.

Number of PPM channels – setting the number of channels for PPM output.

PPM/UDI (S.BUS) mode - defines how the transmitter data is processed. You can choose from the following modes:

- **Direct** - all receiver settings (e.g. Fail-Safe) are not included in serial communication
- **Computed** - all receiver settings (e.g. Fail-Safe) are part of serial communication

Note: *this option does not apply to „EX Bus" outputs. These are always direct without receiver recalculation (if the function "Stabilise EX Bus output" is not activated).*

Stabilise EX Bus output - by confirming this option, you activate flight stabilisation Assist in the EX Bus serial communication output. This mode is required if you use the REX Assist receiver with active stabilisation as a satellite receiver connected to the Central Box.

Low Voltage Alarm - used to set the decision level of the low voltage alarm, which is indicated by the receiver itself. You can also set the low voltage alarm directly in the DC/DS transmitter *„Timers / Sensors/Alarms"* menu).

6.1. PID control setting

Aileron/Roll rate, Elevator/Pitch rate, Rudder/Yaw rate - in this section you set the individual PID control coefficients for each axis separately for multicopter models. These coefficients are applied in all flight modes to stabilise the rotational speed around each axis.

Vertical Speed - PID coefficients to stabilise the climb and descent rate.

Aileron/Roll angle, Elevator/Pitch angle, Rudder/Yaw angle - here you can change the proportional gain of attitude stabilisation, e.g. horizon. The higher the coefficients you specify, the faster the model is reoriented to the new attitude.

6.2. "Stabilise" mode setting

Maximum roll angle - defines the maximum possible tilt angle to the left and right in the horizon stabilisation mode (controlled by aileron input).

Maximum pitch angle - definition of the maximum possible tilt angle in horizon stabilisation mode (controlled by elevator input).

Minimum pitch angle - definition of the minimum possible tilt angle in horizon stabilisation mode (controlled by elevator input).

PID transition delay - used to switch between flight modes that use stabilisation with different gains of the PID coefficients. This feature guarantees that the change of the coefficients does not cause erratic behavior in flight.

Sensor trim (Roll/Pitch) – using these parameters you can fine tune the receiver position in the model if its position is not absolutely parallel to the axis of ailerons and the elevator. Sensor trims are applied in the flight modes where the horizon is stabilised

and you can achieve, for example, with airplane models a slightly pulled horizontal flight.

Quick trim setting - place the model on a flat solid horizontal surface so that its position exactly matches the horizontal flight (a multicopter should be positioned exactly horizontally). Now in the Receiver *„Configuration/Advanced Settings"* activate the "*Set sensor trims now*" command. The calculated values will be stored in receiver memory.

6.3. Acro mode settings

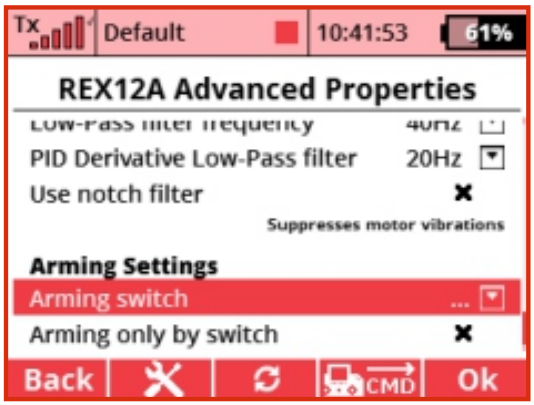
Maximum Aileron/Roll rate, Maximum Elevator/Pitch rate, Maximum Rudder/Yaw rate - specifies the maximum angular rotation speed in individual axes (in degrees per second) that can be safely reached by the model. For acrobatic models, this value can be up to two revolutions per second (720°/s), but for gliders it will be noticeably smaller (e.g. 90°/s).

Aerobatics Factor (Roll/Pitch/Yaw stick priority) - determines how the stabilisation gain will be decreases depending on how the control stick moves away from the center position. For example, a 60% aileron stick priority means that at maximum left or right stick position, the aileron gain will be reduced to 60% and the direct position of the stick will be applied from 40%.

Throttle-PID Attenuation (TPA) – a function for multicopter models, see Chapter 10, "*Other stabilisation features*".

Dead Zone - dead zone parameters indicate the size of the area around the center position of the controls, where the resulting stick position in the given direction is considered zero.

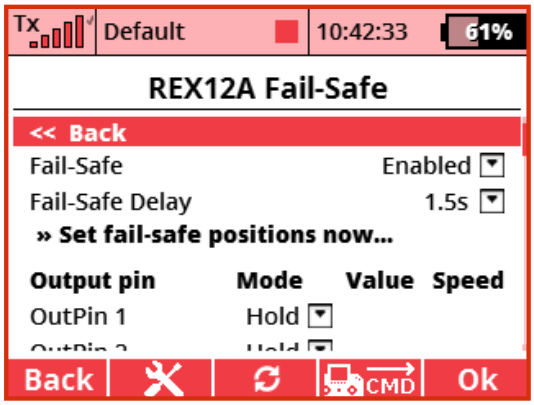
6.4. Arming switch



The arming procedure is automatic for airplane models so that the stabilisation is enabled automatically after receiver initialisation. On the contrary, for multicopters, you must move the controls to the extreme positions when the throttle is pulled low for arming. Alternatively, you can assign a two-position switch on the DC/DS transmitter to arm the stabilisation and make the propellers spin. This switch does not need to be assigned to any channel on the transmitter - the arming command is sent separately as soon as you confirm the dialog box that appears after activating the switch.

Note: *for the DS12 transmitter, the SW module have to be installed for this function ("remote commands" SW module).*

6.5. Fail-Safe



Fail-Safe – turns the Fail Safe function on or off. If the function is disabled, no pulses on the receiver outputs are generated in case of signal loss. If this function is enabled, the receiver

outputs can be configured individually with the following options:

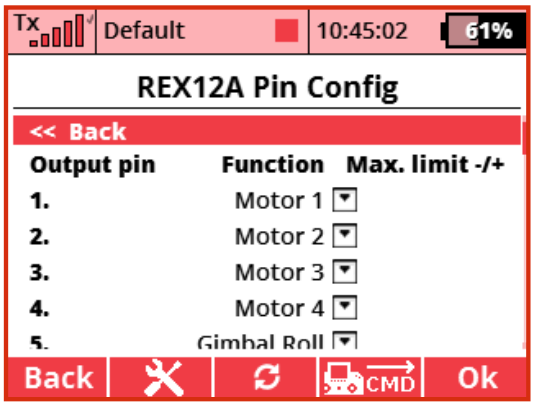
- **Hold** - the receiver repeats the last known values on its output.
- **Out OFF** - the output pin is deactivated.
- **Fail-Safe** - the output is moved to a position given by the parameter *"Value"* at a speed given by *"Speed"* parameter.

You can set the Fail-Safe positions either by editing each output value separately or by simply moving the transmitter controls to the required position and activating the *"Set fail-safe position now"* command.

If you use **intelligent, ie. stabilised Fail-Safe mode**, the specified values of the outputs are used as input for stabilisation and are processed.

Fail-Safe Delay – indicates the time interval from a moment the receiver detects signal loss to when the fail-safe control throws are initiated. After the expiration of this time, the receiver outputs will transfer to preset defaults or will be turned off (according to individual pin settings).

7 Alternative pins configuration



Here you can change the modes of the receiver pins. Servo outputs can be configured, for example, in digital input or digital output mode.

Servo - standard impulse output for servo control (-100% ~ 1ms, 0% ~ 1.5ms, + 100% ~ 2ms). If the output pin is set to *"Servo"* mode, you can specify maximum possible throws that will never be exceeded. These limits should be adjusted to protect individual servos against overshoots and model damage.

Digital input - the logic value of a given signal pin (0 or 1) is transferred to the transmitter in the form of EX telemetry (so it can be further displayed and stored). Receiver pins are equipped with internal pull-up resistors, so you can easily connect the signal wire to the ground for logic level detection. It is not allowed to connect external voltage to this pin.

Digital output - the receiver will discretise the channel value of the given pin. If this value is greater than 1.5ms (>0%), the output pin value will be logic "1". Otherwise, the output value will be logic "0". Using this approach, you can control e.g. simple model lighting made up of LEDs. In this mode, the Fail-Safe settings for the pin are also applied.

Motor 1-8 - for a multicopter model - this parameter is used to identify individual motors (assignment is made automatically via the Quick Wizard). Refresh rate of the motor outputs is 400Hz by

default, and conventional servo pulses or OneShot125 protocol can be used for control.

Camera control (roll, tilting/pitch, and pan/yaw) - output pins assignment for a stabilised camera gimbal controlled by servos.

PPM Positive Output - standard PPM signal with positive logic of the PPM data stream. The idle state of the line is logic 0.

PPM Negative Output - standard PPM signal with inverse logic of the PPM data stream. The idle state of the line is logic 1.

PPM Input - for a given receiver port, the PPM input signal from another receiver is expected. This option is suitable if you want to use a backup receiver with a PPM output stream.

JETIBOX/Sensor EX - connection of telemetry sensor or JETIBOX.

EX Bus - digital bidirectional communication for all 24 channels transmission, telemetry and communication data. This setting is suitable for example in connection with a Central Box or other EX Bus-capable device.

Serial UDI12/16 - serial output suitable for connection of devices with UDI support (Universal Data Interface, e.g. Vbar).

S.BUS - digital communication for transmission of max. 16 channels, does not transmit telemetry data. Suitable for connecting devices supporting this communication to the Duplex system.

LED Strip - a LED strip composed of programmable LED chips can be connected to the dedicated pin of the receiver.

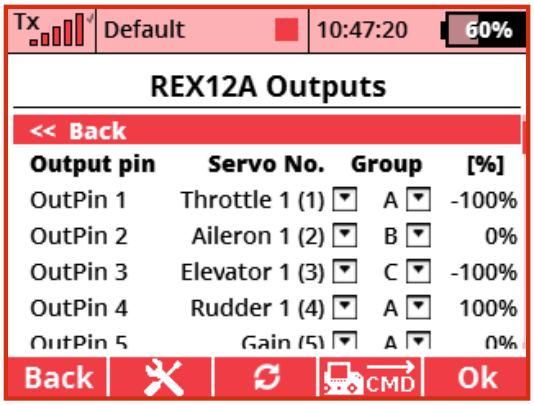
Table of possible functions on the individual receiver pins

	REX 6A	REX 7A	REX 7SA	REX 9SA	REX 10A	REX 12A
Pin1	Y1	Y1	Y1	Y1	Y1	Y1
Pin2	Y2	Y2	Y2	Y2	Y2	Y2
Pin3	Y3	Y3	Y3	Y3	Y3	Y3
Pin4	Y4	Y4	Y4	Y4	Y4	Y4
Pin5	Y5/E1	Y5, LED	Y5, E2	Y5, E2	Y5, LED	Y5
Pin6	Y6/E2	Y6/E1	Y6	Y6	Y6	Y6
Pin7	Ext.	Y7/E2	Y7	Y7	Y7	Y7
Pin8		Ext.	Batt.	Y8	Y8/E2	Y8/E2
Pin9			E1	Y9, E1	Y9	Y9
Pin10			Ext.	Ext.	Y10	Y10
Pin11					Bat.	Y11
Pin12					Bat.	Y12,LED
Pin13					E1	E1
Pin14					Ext.	Ext.

Output types:

- ***Y1 – Y12:*** *servo output, digital output, digital input, motor 1-8 (multicopters), camera roll, pitch, and yaw.*
- ***E1, E2:*** *JETIBOX/EX sensor, PPM output, PPM input, EX Bus output, UDI output, S.BUS*
- ***LED:*** *the possibility of connecting LED strips with WS2812 chips*
- ***Ext.:*** *JETIBOX/Sensor EX*
- ***Batt.:*** *connecting the power supply*

7.1. Receiver Outputs

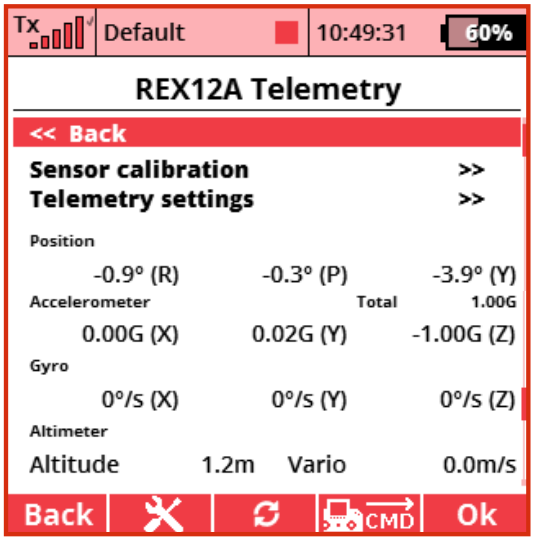


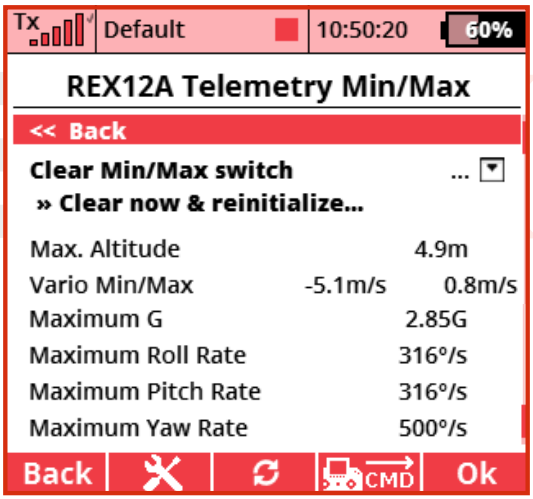
The receiver output settings screen allows you to redirect the transmitter channels to any receiver output. For clarity, the transmitter channels are described by their numerical value and their meaning.

Group: As the last parameter, you can set the output group (A-H) for each servo separately. Assigning servo outputs to the same group means that their control pulses will be generated at the same time. For the 100Hz mode, we recommend using only A-C groups. In addition, please note that the servos belonging to the same function should be ideally in the same group.

Note: *channel redirection is applied to the received data before stabilisation processing, so after any change in the output pins assignment, we recommend you to re-calibrate the "Assist channels in the „Configuration/Channels Assignment" menu.*

8 Real time telemetry





By default, the receiver provides operational telemetry data such as battery voltage and signal strength. With integrated inertial sensors, it can also provide its orientation in individual axes (roll, pitch and yaw) or total G-force.

Up to 3 additional Duplex sensors can be connected to the receiver. For this purpose you can use the ports marked Ext, E1 and E2 (the E1 and E2 have to be first switched to the *"telemetry inputs"* mode).

In the receiver menu (or through the JETI Studio program) you can view the current values, the minimum and maximum values reached. The maximum measured values can be reset in the *"Telemetry Min/Max"* menu. The newly measured max and min values will continue to be displayed until the manual reset is activated.

9 Solving the most common problems

9.1. General

After binding the receiver, it is not possible to configure it using the DC/DS transmitter. But the Device Explorer screen displays the correct name (e.g. REX12A).

Check the transmitter version **(minimum version supporting the REX A receiver is 4.24)**. Also, make sure that in the Devices folder at your transmitter contains files which match the receiver name and its language version: *"REX12A.BIN", "RX12AEN.BIN", "RX12ACZ.BIN"* etc. If these files are not located in the folder, please download the latest configuration files for the receivers from *www.jetimodel.com*. These files are also a standard part of the transmitter update.

9.2. Airplane models

1. **At high speed and straight flight, the model oscillates in one of the axes (e.g. ailerons).**
   Reduce the Gain value for that axis in the receiver settings *„Configuration/Airplane Settings"* menu.
2. **In Heading Hold mode, the model does not hold its direction.**
   Increase the Hold value for the elevator or rudder axis in the receiver settings *„Configuration/Airplane Settings"* menu.
3. **In Heading Hold mode, the model does not hold a straight flight and constantly turns to one side.**
   In this mode, it is not possible to use trims as they distort the input information for stabilisation. Switch to Normal mode (or deactivate stabilisation if necessary), trim the model in straight

flight and land. Now reassign the primary channels *„Configuration/Channel Assignment"* menu.

4. **When the stabilisation is enabled, the control surfaces do not return to the center position even when the model is at rest for a longer time.**
   In Heading Hold mode, the model remembers its original direction before displacement and tries to return to that position. Therefore, control surfaces may be out of neutral even when the model is at rest. Switch stabilisation to another mode (e.g. Normal or Manual).

5. **Stabilisation gain tuning channel for ailerons, or other axis, cannot be assigned.**
   Please make sure that the stabilisation gain tuning function has been created on the transmitter and has been assigned to a free channel (8-24). Stabilisation gain control knob, or a three-way stabilisation flight mode switch (Off/Normal/Heading Hold) should be added in the *„Model/Functions Assignment"* menu in your DC/DS transmitter. Subsequently select this function for a free channel in the *„Model/Servo Assignment"* menu. Now it is possible to start the Quick Wizard in the receiver menu, where in step 6 this three-position switch can be used.

9.3. Multicopter models

1. **The transmitter announces "Armed", but the motors are not spinning.**
   In the *„Configuration/Multicopter Settings"* menu, be sure to pay attention to the Minimum running throttle parameter. Increase

the value in small steps to make the motors spin after arming.

2. **When at full throttle, the multicopter oscillates quickly, but when the throttle is in the middle, the flight is calm.**
   We recommend enabling the *"Throttle-PID Attenuation (TPA)"* function in the *„Configuration/Advanced Properties"* menu. Set the *"TPA breakpoint"* to a value before the oscillations start to appear (e.g. 50%) and increase the *"TPA value"* by 10% increments.

3. **Stabilisation gain tuning channels for individual axes cannot be assigned.**
   Please make sure that the stabilisation gain tuning function has been created on the transmitter and has been assigned to a free channel (8-24). Stabilisation gain control knob or a three-way stabilisation flight mode switch should be added in the *„Model/Functions Assignment"* menu in your DC/DS transmitter. Subsequently select this function for a free channel in the **„Model/Servo Assignment"** menu. Now it is possible to start the Quick Wizard in the receiver menu, where in step 6 this three-position switch can be used.

10 Receiver update and configuration

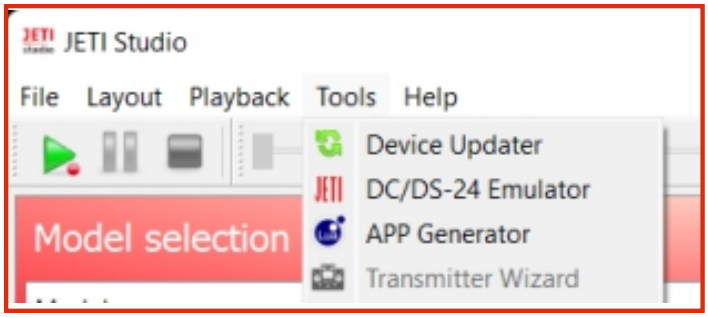
10.1. Update the receiver

REX A receivers can be updated and configured by PC via JETI USB Adapter. The JETI Studio software is intended for all standard updates – you can download it from our website: **www.jetimodel.com**

USB adapter

Procedure:

1. Disconnect all devices from the receiver (sensors, servos, etc.).
2. Connect the USB adapter to the PC.
3. Start the JETI Studio program on the PC and select the correct serial port for communication (COM port).
4. Open the *"Device Update"* dialog window.
5. Connect the Ext. of the receiver to the USB adapter.
6. The program identifies the connected device and offers the exact update. Select the firmware version and click the *"Update"* button.



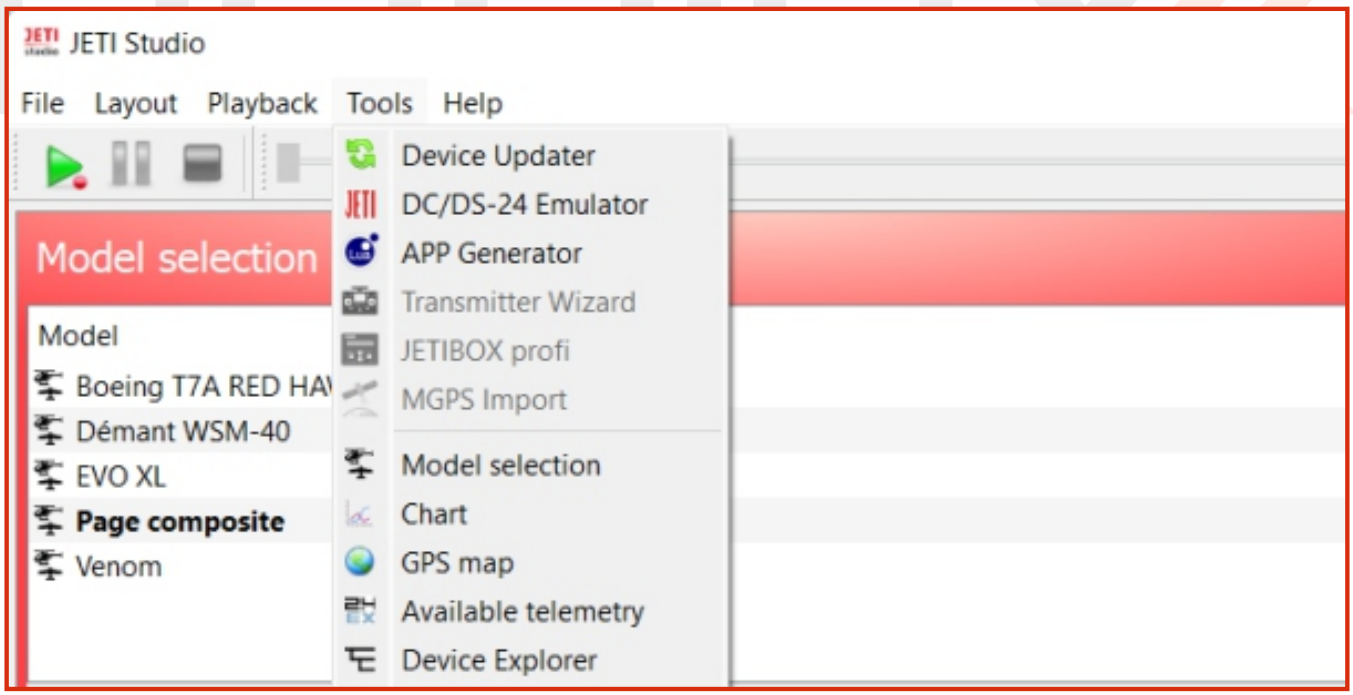
7. After the update is complete, disconnect the receiver.

10.2. Configuring the receiver via a PC

With the JETI Studio program, it's possible to configure the receiver without a Duplex DC/DS transmitters, for example, if you use the DuplexTx module in a transmitter from another manufacturer.

1. Connect the receiver via its Ext. port to the USB Adapter and then to the computer. If the receiver is powered through a USB Adapter, make sure that all servos and sensors are disconnected.

2. In JETI Studio, choose the Device Explorer tool. The receiver should be detected and displayed after a moment. By double clicking you can now enter its configuration.

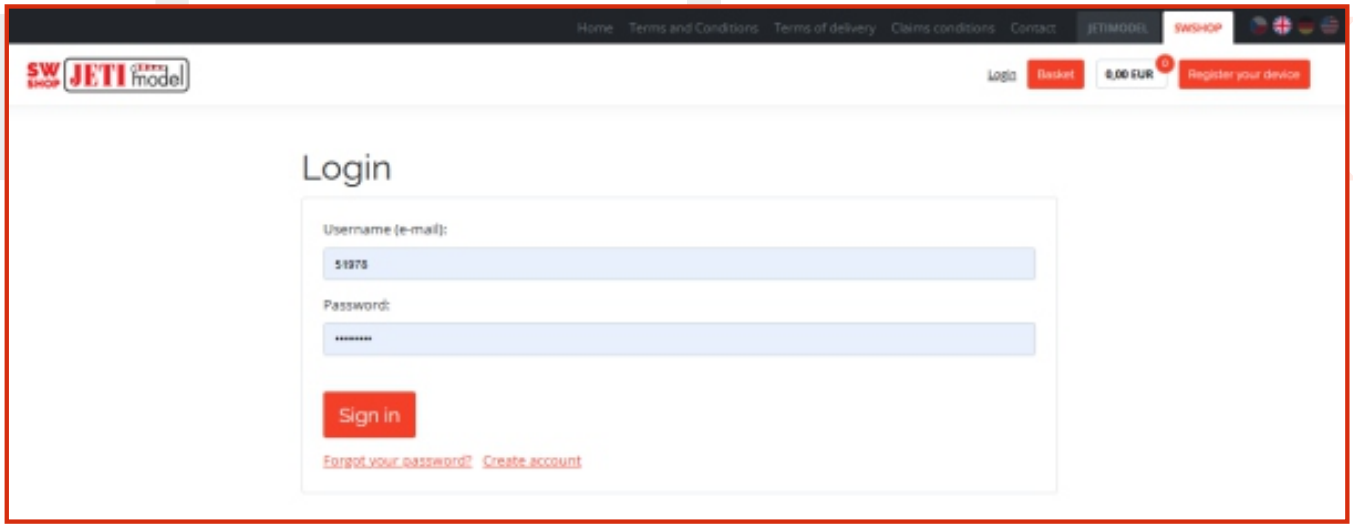


11 Activation of extension functions

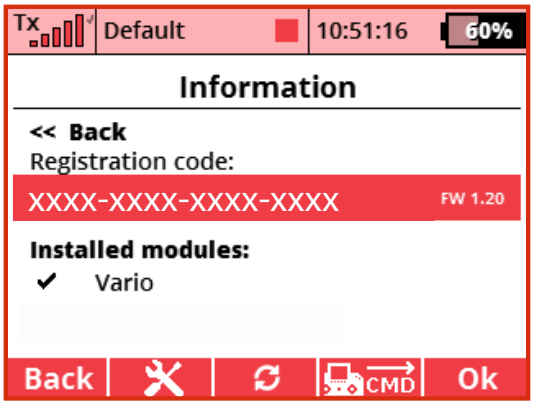
All receivers of the REX Assist series have an integrated vario and altimeter, including program support and telemetry data of these modules. These software modules are not active by default. They can be activated at any time after their purchase according to the following procedure:

11.1. Registration and purchase of the module

1. check if your receiver has the latest firmware version. If not, update it using a USB adapter and JETI Studio
2. on the ***website shop.jetimodel.cz*** register and log in to system



3. register the receiver as a new device. Select the correct type of receiver in the *"Device registration without serial number"* menu. Its *"Registration code"* can be found in the receiver menu in the *"Info"* item.

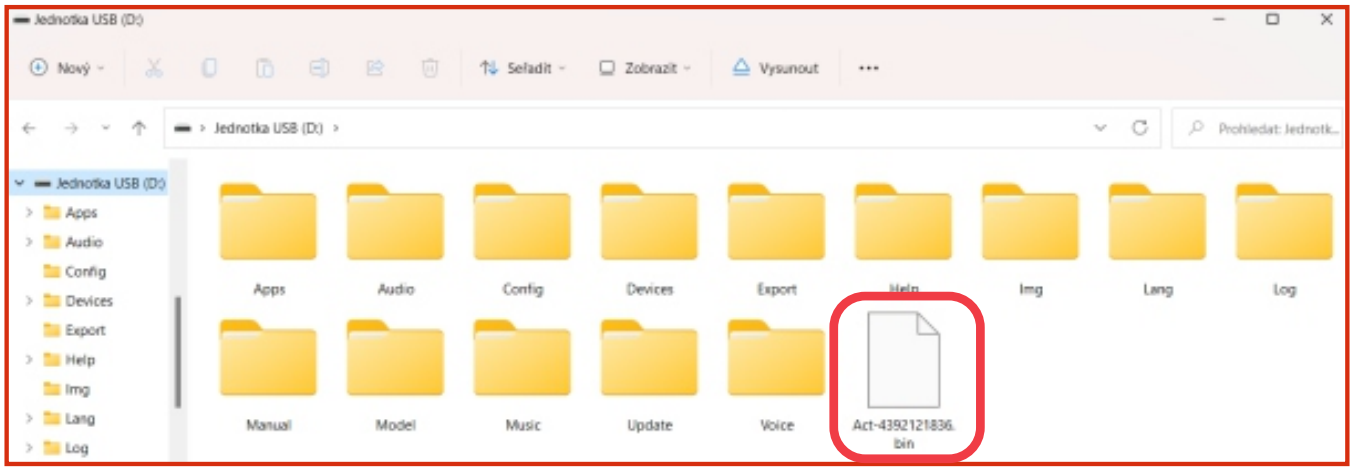


4. to get the registration code, connect the paired receiver to the transmitter and open the directory ***„Menu/ Model/ Device Explorer/REXxA/ Info"***
5. open the menu of the registered receiver, select the expansion module *"Vario for REX ASSIST"* and make the payment
6. after payment verification, you will receive an activation file in the format ***"Act-xxxxxxxxxx.bin"*** in your email

11.2. Activating the receiver's vario & altimeter function

1. check if your receiver has the latest firmware version
2. disconnect all sensors from it and bind it with the transmitter
3. turn off the receiver and the transmitter
4. connect the transmitter to the PC via a USB cable. Copy the activation file you received by email directly to the root folder of the transmitter's SD card.

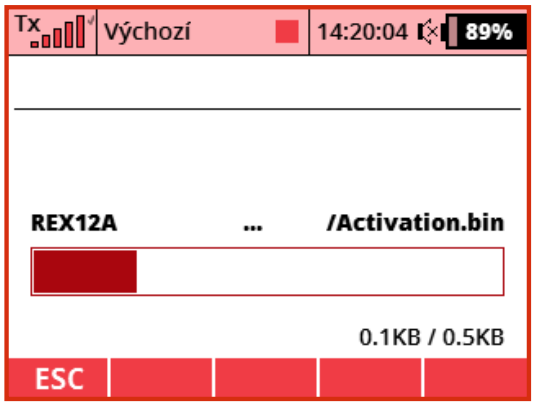
Note: *the activation file must not be placed in any folder or subfolder of the transmitter directory!*



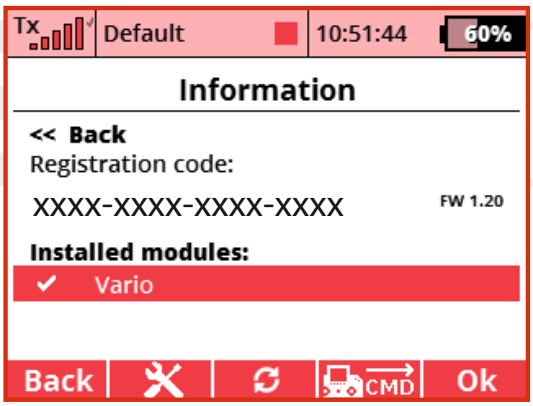
5. turn on the receiver first and then the transmitter. In the transmitter, go to *"Menu/Model/Device explorer"*

Note: *during the entire activation process, do not have any sensor connected to thee receiver and its power supply has to be stabl.*

6. the transmitter will ask you for activation and after confirmation the receiver will start the process of activating the vario module and the altimeter

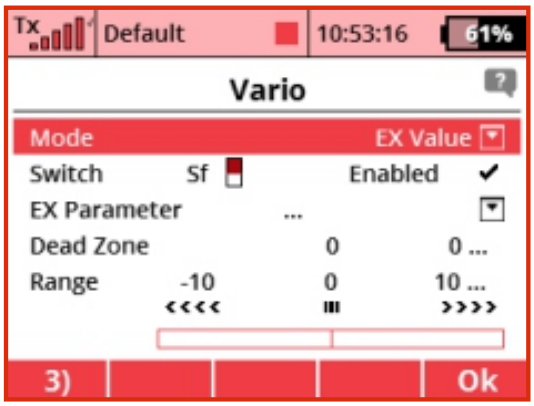


7. after activation, the *"Vario"* item will be displayed as enabled in the *"Info/Installed modules"* menu of the receiver

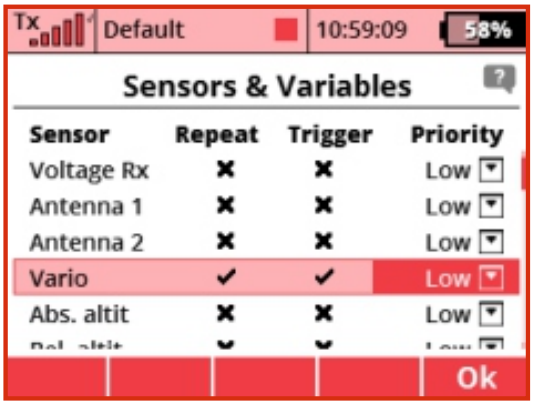


8. further vario settings are possible in the transmitter menu *"Menu/Sensor timers/Vario"*

9. the current values of absolute and relative altitude, atmospheric pressure, vario and others are automatically displayed in the relevant places of the transmitter menu. You can use this telemetry data for the alarms, voice messages, logic functions, etc.



10. telemetry data can be stored in the memory of the Duplex transmitter for later analysis via the **JETI Studio program**



ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

For receivers we grant a warranty of 24 months from the day of purchase under the assumption that they have been operated in conformity with these instructions at recommended voltages and that they were not damaged mechanically. Warranty and post warranty service is provided by the manufacturer.

We wish you successful flying with the products of: JETI model s.r.o. Příbor, www.jetimodel.com

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

Warning: *Changes or modifications to this device not expressly approved by Esprit Model/JETI USA could void the user's authority to operate the equipment. "This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment is in direct contact with the body of the user under normal operating conditions. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter." Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.*

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. This device complies with the Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ENGLISH

Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)

This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.
For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.
Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.
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For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Declaration of Conformity

in accordance with the regulations of EU Directive
RED 2014/53/EU and RoHS 2011/65/EU.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Producer: **JETI model s.r.o.**
Lomená 1530, 742 58 Příbor, Česká republika
IČ 26825147

declares, that the product

Type designation: receiver DUPLEX EX
Model number: REX6A
Frequency band: 2400,0 – 2483,5 MHz
Max power: 100 mW e.i.r.p.

The stated product complies with essential requirements of RED Directive 2014/53/EU and RoHS Directive 2011/65/EU.

Harmonised standards applies:

Measures for the efficient use of the radio frequency spectrum [3.2]

EN 300 328 V 2.2.2

Protection requirements concerning electromagnetic compatibility [3.1(b)]

EN 301 489-1	V 2.1.1
EN 301 489-3	V 2.1.1
EN 301 489-17	V 3.1.1

Electrical Safety and Health [3.1(a)]

EN 62368-1:2015
EN 62479:2010

RoHS

EN 50581:2012

Příbor, 11.5.2021

Ing. Stanislav Jelen,
Managing Director

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	declares, that the product
Type designation:	receiver DUPLEX EX
Model number:	REX7A, REX10A, REX12A
Frequency band:	2400,0 – 2483,5 MHz
Max power:	100 mW e.i.r.p.

The stated product complies with essential requirements of RED Directive 2014/53/EU and RoHS Directive 2011/65/EU.

Harmonised standards applies:

Measures for the efficient use of the radio frequency spectrum [3.2]

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	declares, that the product
Type designation:	receiver DUPLEX EX
Model number:	REX7S, REX7SA, REX9S, REX9SA
Frequency band:	2400,0 – 2483,5 MHz
Max power:	100 mW e.i.r.p.

The stated product complies with essential requirements of RED Directive 2014/53/EU and RoHS Directive 2011/65/EU.

Harmonised standards applies:

Measures for the efficient use of the radio frequency spectrum [3.2]

EN 300 328 V 2.2.2

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EN 301 489-1	V 2.1.1
EN 301 489-3	V 2.1.1
EN 301 489-17	V 3.1.1

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EN 62368-1:2015
EN 62479:2010

RoHS

EN 50581:2012

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